

### LISTING OF ALL CLAIMS

1. (Currently Amended) A method of processing a silicon substrate, comprising:  
  
    evacuating a vacuum chamber in which the substrate is placed to a first pressure,  
  
    introducing a fluid other than molecular oxygen into the vacuum chamber as a background fluid, and  
  
    subsequently, implanting ions into the substrate by applying an ion beam thereto, in the presence of the background fluid, to form a buried oxide layer under a top silicon layer, wherein the fluid inhibits formations of threading dislocations in the top silicon layer for reducing a defect density of the processed substrate.
2. (Canceled)
3. (Canceled)
4. (Canceled)
5. (Canceled)
6. (Original) The method according to claim 1, wherein the first pressure is less than about  $1 \times 10^{-5}$  Torr.
7. (Original) The method according to claim 1, wherein introducing the fluid into the vacuum chamber produces a second pressure in the vacuum chamber that is less than about  $1 \times 10^{-3}$  Torr.
8. (Currently Amended)     ~~A~~ The method according to claim 1 of processing a silicon substrate, comprising:  
  
    evacuating a vacuum chamber in which the substrate is placed to a first pressure,  
  
    introducing a fluid other than molecular oxygen into the vacuum chamber as a background fluid,

subsequently, implanting ions into the substrate, in the presence of the background fluid, to form a buried oxide layer under a top silicon layer, wherein the fluid inhibits formations of threading dislocations in the top silicon layer for reducing a defect density of the processed substrate, and

~~further including~~ actively controlling the amount of fluid introduced into the vacuum chamber based upon a parameter measured in the chamber.

9. (Original) The method according to claim 8, further including selecting the parameter from the group consisting of pressure, water vapor/ion concentration, and temperature.

10. (Previously Presented) A method of processing a silicon substrate, comprising

evacuating a vacuum chamber in which the substrate is placed to a first pressure,

introducing a fluid other than molecular oxygen into the vacuum chamber as a background fluid,

actively controlling the amount of fluid introduced into the vacuum chamber based upon a parameter measured in the chamber, and

implanting ions into the substrate to form a buried oxide layer under a top silicon layer, wherein the fluid inhibits formations of threading dislocations in the top silicon layer for reducing a defect density of the processed substrate,

wherein the parameter includes a measurement of an ion beam current.

11. (Original) The method according to claim 10, wherein the measurement includes a measurement of a decrease in the beam current due to the fluid in the chamber.

12. (Previously Presented) A method of processing a substrate, comprising:

evacuating a vacuum chamber in which the substrate is placed to a first pressure;

introducing a fluid into the vacuum chamber;

implanting ions into the substrate using an ion beam to form a buried oxide layer under a

top silicon layer;

measuring a decrease in the ion beam current level due to the fluid in the chamber; and

adjusting the fluid level based upon the measured ion beam current level.

13. (Original) The method according to claim 12, further including the step of selecting the fluid from fluids that inhibit formations of threading dislocations in the top silicon layer for reducing a defect density of the processed substrate.

14. (Canceled)

15. (Canceled)

16. (Canceled)

17. (Canceled)

18. (Canceled)

19. (Canceled)

20. (Currently Amended) A method of processing a silicon substrate, comprising:

evacuating a vacuum chamber in which the substrate is placed to a first pressure,

introducing a hydrogen containing fluid into the vacuum chamber as a background fluid,  
and

subsequently, implanting ions into the substrate by applying an ion beam thereto, in the presence of the background fluid, to form a buried oxide layer under a top silicon layer, wherein the background fluid inhibits formations of threading dislocations in the top silicon layer for reducing a defect density of the processed substrate.

21. (Previously Presented) A method according to claim 20, further comprising selecting the fluid from the group consisting of water vapor, heavy water, air, and hydrogen gases.

22. (Currently Amended) A method of processing a silicon substrate, comprising:

evacuating a vacuum chamber in which the substrate is placed to a first pressure,  
introducing a fluid functioning as a reducing agent into the vacuum chamber as a background fluid, and

subsequently, implanting ions into the substrate by applying an ion beam thereto, in the presence of the background fluid, to form a buried oxide layer under a top silicon layer, wherein the background fluid inhibits formations of threading dislocations in the top silicon layer for reducing a defect density of the processed substrate.

23. (Previously Presented) A method according to claim 22, further comprising selecting the fluid from the group consisting of hydrogen gases and argon.

24. (Currently Amended) A method of processing a silicon substrate, comprising:

evacuating a vacuum chamber in which the substrate is placed to a first pressure,  
introducing a fluid functioning as a surface oxide inhibiting agent into the vacuum chamber as a background fluid, and

subsequently, implanting ions into the substrate by applying an ion beam thereto, in the presence of the background fluid, to form a buried oxide layer under a top silicon layer, wherein the background fluid inhibits formations of threading dislocations in the top silicon layer for reducing a defect density of the processed substrate.

25. (Previously Presented) The method of claim 24, further comprising selecting said fluid to be hydrogen gases.